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Remarks

The copending application information beginning on page 1, line 6 has been updated and the specification and claims 10 and 14 have been further amended as shown above. Antecedent basis for the specification and claim amendments may be found in the written description at, e.g., page 2, line 13, page 21, lines 23-24, page 22, lines 20-24 and page 23, lines 6-13.

Following entry of this amendment, claims 1-20 will be pending in this application with claims 1-9 having been withdrawn from consideration.

Applicants hereby confirm their election of Group II, viz. claims 10 – 20, without traverse.

Reconsideration of the rejections is requested in view of the following remarks.

Rejection of claims 10-20 under 35 U.S.C. §112, second paragraph

Claims 10-20 were rejected under 35 USC §112, second paragraph, as being indefinite on grounds, *inter alia*, that:

"The preamble of claim 10 requires making of a "barrier sheet", however the substrate in the body of the claim is of no particular shape, hence the preamble and body are not commensurate in scope." (see the Office Action at page 3, numbered paragraph 6).

Reconsideration is requested. Claim 10 has been amended as shown above to recite a "thermoplastic sheet substrate". This rejection is now moot and may be withdrawn.

The Office Action also asserted that:

"Use of relative terms in the claims that lack clear metes and bounds in the claim or in the specification or in cited relevant prior art, is vague and indefinite. In independent claim 10, line 3, "transparent" to what? The claims provide no relevant information, and while a reader may assume that visually transparent is intended, assumptions do not necessitate meanings. Review of the specification found "transparent" used on pages 21 and 23 in "transparent [oxygen] barrier", however in neither case was a definition or clear metes and bounds provided, but lines 13-22 of

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page 21 did provide examples that required an acrylate monomer layer formed, then cross-linked on the substrate, which layer was then coated with SiO_x, (later referred to as silicon oxide) or Al oxide. Also note the subscript x is undefined, and that examples do not constitute definitions. Hence, the scope of "transparent barrier film" in the claims is unclear." (see the Office Action at pages 3-4, numbered paragraph 6).

The Office Action also asserted that:

"On page 21, as noted above, x in SiO_x is undefined which the examiner assumes means it is non-stoichiometric or with the later used silicon oxide, generally includes any oxides of Si." (see the Office Action at page 5, numbered paragraph 8).

Reconsideration is requested. A person having ordinary skill in the art will understand from applicants' specification that the word "transparent" refers to a barrier having a suitable visual appearance for the intended barrier film application (see e.g., page 23, lines 25-27), and that a suitable appearance may depend on the chosen packaging, protective or other barrier film application (see e.g., page 1, lines 15-22 and 26-29 and page 2, lines 7-9). A person having ordinary skill in the art will also understand that the notation SiO_x refers to all oxides of silicon, including non-stoichiometric oxides.

The Office Action also asserted that:

"In line 4 of claim 10 "smoothing" in "smoothing layer" is a relative description of an effect, but since there is no necessary roughness or any surface on the substrate that necessarily needs any smoothing, the scope of this effect and what is included by "smoothing layer" is uncertain. A review of the specification found no use of this phrase therein, hence read in light of the specification the scope is unknown. It was noted that on page 5, line 28-page 6, line 3, it was disclosed that the thickness of the acrylate layer was desired to be sufficient for smoothing roughness of underlying substrate, where the adequate smoothing was needed for vacuum metallizing (not the transparent barrier films). On page 22, lines 25-29+ substantial improvement of O-permeability was attributed to forming a liquid film of polyfunctional acrylate by condensing from vapor phase to assure smooth and uniform coating, forming an excellent surface for metallization. Neither of these provides necessary definition nor scope for the "smoothing layer" of the claims. It is

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noted that all discussion in the specification concerning durability or importance of the smoothness of the acrylate layer was associated with the metallization teachings, not the transparent barriers (Si or Al oxides) and is analogous to the teachings of Revell (5,021,298) concerning the criticality of the smoothness of the plastic coating for achieving desired barrier properties upon metallization. Note extending the same criticality to the oxide coatings would have the same degree of obviousness in either case.

"In claim 14, "protective" describing "protective layer" is also a relative term. Protection from what? Is it a particular environment or action or something else? The scope of what is included by protective layer is unclear, and examples of acrylate layers given in the specification are not definitions, especially as the term was not found used in association with "transparent barrier film" with which it is claimed." (see the Office Action at pages 4-5, numbered paragraph 6).

Reconsideration is requested. Applicants have used the terms "smoothing layer" and "protective layer" in a manner consistent with the specification and with their discussion of transparent barrier films. See for example the text at page 20, line 26 through page 21, line 3, page 21, lines 9-11, page 22, lines 20-29 and page 23, lines 7-13. The recited smoothing layer (as amended in claim 10, the recited "acrylate smoothing layer") compensates for inherent roughness in the thermoplastic sheet substrate and produces a surface that will accept a barrier coating sufficiently continuous for low oxygen permeability, see e.g., page 20, line 26 through page 21, line 3). The recited protective layer helps to protect the underlying barrier layer from damage and to retain oxygen barrier properties, see e.g., page 21, lines 23-28 and page 22, lines 22-24. A person having ordinary skill in the art will understand from applicants' specification that the recited substrate surface effects and the recited barrier layer effects are provided for metal oxide as well as for metal barrier layers. Applicants thus request withdrawal of the rejection of claims 10-20 under 35 U.S.C. §112, second paragraph as being indefinite.

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Rejection of claims 10-20 under 35 U.S.C. §112,**First Paragraph (Written Description)**

Claims 10-20 were rejected under 35 USC §112, first paragraph, as failing to comply with the written description requirement on grounds, *inter alia*, that:

"The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

"Given that this case is a continuation of parent case 08/741,609, and the claims submitted with the present application are different than the original claims of the parent, they are not part of the original specification.

"As found in reviewing the specification for meaning as discussed in Section 5 above, "smoothing layer" was not used or claimed in the original specification, hence is considered to include New Matter. The term while not having a defined scope, can logically be considered to include any film capable of providing a smoother layer, but the only contemplated layer found in the original specification is a layer of acrylate monomer deposited and cross-linked, either with the transparent [oxide] barrier film, or with the more thoroughly discussed metalized layer." (see the Office Action at page 5, numbered paragraph 9).

Reconsideration is requested. Claim 10 has as noted above been amended to recite "an acrylate" smoothing layer. Also, when applicants state for example at page 21, lines 1-3 (emphasis added) that:

"A layer of acrylate about two micrometers thick is adequate for smoothing the surface for producing a surface that will accept a barrier coating sufficiently continuous for low oxygen permeability"

they clearly disclose the recited smoothing layer. An applicant is entitled to claims as broad as the prior art and his disclosure will allow, see *In re Rasmussen*, 650 F.2d 1212, 1215, 211 USPQ 323, 326 (CCPA 1981). The specification as a whole must be considered, see *In re Wright*, 866 F.2d 422, 424, 9 USPQ2d 1649, 1651 (Fed. Cir. 1989) and *In re Smythe*, 480

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F.2d 1376, 1384, 178 USPQ 279, 285 (CCPA 1973). The recitation in claims 10-20 of a "smoothing layer" is not new matter.

The Office Action also asserted that:

"While there is generic (undefined) disclosure of "transparent barrier film", the only disclosure of sputtering or plasma enhanced CVD are specific to the taught Si oxide or Al oxide, with the sputtering being specific to sputtering of aluminum or silicon in an oxygen plasma, hence these deposition processes claimed for the present breath of "transparent barrier film" include New Matter also." (see the Office Action at pages 5-6, numbered paragraph 9).

Reconsideration is requested. When applicants state for example at page 21, lines 18-21 (emphasis added) that:

"Typical techniques for depositing these materials may include sputtering aluminum or silicon in an oxygen plasma atmosphere for depositing the oxide, or plasma enhanced chemical vapor deposition. With these processes, a separate plasma surface treatment preceding the deposition of the transparent oxide may not be required."

applicants are not saying that no other techniques may be used. A person having ordinary skill in the art will recognize from applicants' disclosure that that the recited transparent metal oxide layer may be formed using techniques other than sputtering or plasma enhanced CVD.

The oxygen barrier forming steps in claims 10-20 are not new matter.

The Office Action also asserted that:

"In claim 14, the use of a generic "protective layer" on the transparent barrier film of claim 10, also is inclusive of New Matter, since it is broader than the scope of the only disclosed layer (acrylate) that was taught as deposited on the oxygen barrier material, as also discussed in section 6 above." (see the Office Action at page 6, numbered paragraph 9).

Reconsideration is requested. Claim 14 has as noted above been amended and a protective layer is now recited in claim 10. Also, when applicants state for example at page 22, lines 20-24 (emphasis added) that:

"A preferred sheet of material with low oxygen permeability has a layer of polymerized acrylate, a layer of barrier material such as SiO₂, Al₂O₃, or metal and

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another layer of polymerized acrylate on a sheet plastic substrate. The layers of acrylate reduce permeability dramatically and **the layer overlying the barrier material protects the barrier material from mechanical damage and corrosion, and also provides a surface suitable for printing.**"

applicants are not saying that the protective layer may only be formed from acrylates. A person having ordinary skill in the art will recognize that applicants are discussing a preferred embodiment and that other embodiments may be formed. Such a person will also recognize from the immediately preceding paragraph at page 22, lines 12-19 that many materials other than acrylates may be employed to protect an oxygen barrier material. The protective layer originally recited in claims 14 and 15 and now also recited in claim 10 is not new matter.

Applicants thus request withdrawal of the rejection of claims 10-20 under 35 U.S.C. §112, first paragraph for failing to comply with the written description requirement.

Rejection of claims 10-20 under 35 U.S.C. §112,

First Paragraph (Nonenablement)

Claims 10-20 were rejected under 35 USC §112, first paragraph, as failing to comply with the enablement requirement on grounds that:

"The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most clearly connected, to make and/or use the invention.

"As discussed above, "transparent barrier film", "smoothing layer", "protective layer", sputtering and PECVD, lack enablement for their present scope in the claims." (see the Office Action at page 6, numbered paragraph 10).

Reconsideration is requested. When making a rejection for non-enablement, the Examiner "must provide a reasonable explanation as to why the scope of protection provided by a claim is not adequately enabled by the disclosure", see MPEP §2164.04. No such showing has been provided. For example, no evidence has been provided that persons having ordinary skill in the art have not been taught "how to make and use the claimed invention without undue experimentation", *id* at §2164.04. Applicants thus request withdrawal of the rejection of

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claims 10-20 under 35 U.S.C. §112, first paragraph for failing to comply with the enablement requirement.

Rejection of Claims 10-12, 14-16 and 19 for Double Patenting

Claims 10-12, 14-16 and 19 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3-11 and 13 of U.S. Patent No. 5,725,909 (Shaw et al. '909). Upon allowance of claims 10-12, 14-16 and 19 in the present application, applicants are willing to submit an appropriate terminal disclaimer over Shaw et al. '909.

**Rejection of claims 10 and 16-18
under 35 U.S.C. §102(b) or (e)**

Claims 10 and 16-18 were rejected under 35 USC §102(b) or (c) as being anticipated by U.S. Patent No. 5,364,666 (Williams et al. '666), on grounds that:

"Given all the New Matter in the claims that was effectively added on the filing date (11/26/03) of this case, the 102(b) would appear to be the most appropriate, unless support apparently missing from the specification can be shown to be present in the preceding cases, such as the related CIP's.

"In Williams ('666), a sequence of Si oxide based films are deposited to form a gas and water barrier film that may be transparent, where the substrate is a plastic, exemplified by PET (a thermoplastic), which may be shaped as packaging or containers, etc. The preferred deposition process is PECVD for the barrier materials, but other deposition techniques, such as sputtering are also taught as useful. Williams teaches that their first Si oxide deposit will inherently effect surface morphology, where the first set of steps removed and/or redistribution foreign surface particles, hence this first layer may be considered to read on applicant's board, and essentially undefined "smoothing layer", because it effects a type of smoothing on the substrate surface enabling complete coverage with improved permeability properties after the second layer. The second layer of Si oxide then deposited reads on the claimed oxygen barrier material. See the abstract; col. 1, lines 5-10 & 42-68; Summary,

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especially col. 2, lines 6-27 & 33-43; col. 3, lines 15-25+ & 44-55; col. 4, lines 8-43+; col. 6, lines 42-51; and Table on col., 7." (see the Office Action at page 9 numbered paragraph 13).

Reconsideration is requested. As explained above rejected claims 10 and 16-18 do not contain new matter and thus a rejection under 35 U.S.C. §102(b) over Williams et al. '666 would not be appropriate. In any event Williams et al. '666 do not apply a smoothing layer, an inorganic oxide oxygen barrier layer and a protective layer. Williams et al. '666 deposit two SiO_x layers. Applicants thus request withdrawal of the 35 U.S.C. §102(b) or (e) rejection of claims 10 and 16-18 as being anticipated by Williams et al. '666.

**Rejection of claims 10-11, (12) and 13-19
under 35 U.S.C. §102(e)**

Claims 10-11, (12) and 13-19 were rejected under 35 U.S.C. §102(e) as being clearly anticipated by U.S. Patent No. 6,497,598 B2 (Affinito), on grounds that:

"It is noted that while the patent providing Affinito's effective filing date is December 16, 1998, which is after applicant's parents filing date, the New Matter discussed, above, was in the claims filed November 26, 2003, hence November 26, 2003 may be considered to be the effective date for the claim as presently written. Claim 12, might arguably be considered supported in the parent and in the grandparent (col. 6, lines 56-62 and col. 17, lines 28-59 in PN5,440,446), because a smoothing effect for the particular vapor deposited cross-linked acrylate monomers coating are discussed in same circumstances, but they are not clearly associated with the claimed transparent barrier film, so claim 12 is listed above in parenthesis.

"In Affinito, see the abstract; Figures 1 & 2; col. 1, line 35- col. 2, lines 13 & 33-59, especially 52-59; col. 3, line 11- col. 4, line 45, especially col. 3, line 52-60 and col. 4, lines 24-45 for vacuum deposition, including flash evaporation of monomers for first (smoothing) and succeeding polymer layers, and sputtering or PECVD of the ceramic barrier layer, and col. 4, lines 3-8 for substrates that include thermoplastics like PET; col. 4, line 9-11 that include acrylic or methacrylic polymer layers, noting that the taught monomers therefore are inclusive of acrylates, and col.

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4, lines 12-23 which list various preferred transparent ceramics. Note Figure 2, illustrates the multilayer configuration that corresponds to claim 13, which is also, structurally described in patent claims 1-2, 4-5, 8, 10-12 and 14-16." (see the Office Action at pages 9-10, numbered paragraph 14).

Reconsideration is requested. As explained above rejected claims 10-11, 12 and 13-19 do not contain new matter. The October 31, 1996 filing date of applicants' parent application Serial No. 08/741,609 precedes Affinito's December 16, 1998 parent application filing date. Affinito is not available as a reference. Applicants thus request withdrawal of the 35 U.S.C. §102(e) rejection of claims 10-11, 12 and 13-19 as being anticipated by Affinito.

Rejection of claims 10-19 under 35 U.S.C. §103(a)

Claims 10-19 were rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 4,842,893 (Yializis et al. '893) or U.S. Patent No. 5,032,461 (Shaw et al. '461) in view of European Patent Application No. EP 0 475 441 A2 (Komiya EP), on grounds that:

"The primary references teach flash evaporating and curing monomers of acrylates on substrates that may be flexible plastics, like polyesters, which are thermoplastics, and where the coatings may be used for packaging materials. An inorganic or metal layer may be vacuum (evaporation or sputter) deposited thereon, followed by another vapor deposited acrylate monomer layer, which is cross-linked. Additional interlevel layers may also be deposited. Continuous substrates and rotating drum supports are illustrated and discussed. In Yializis et al (893), see the abstract; Figures 1-3, 4d & 5; col. 1, lines 12-22 & 43-48 (for food packaging or protective coatings, etc); col. 2, lines 28-50+; col. 3, lines line 8 (flash evaporated), 20-25 (curing), and 26-65 (substrates, e.g. polyester or polyolefins, flexible, packaging); col. 4, 23- col. 5, line 30+, esp. col. 4, lines 26-28 for vacuum system and moveable support, line 35 for continuous moving surface, lines 48-49 for smooth surface and sheet or flexible material substrate, lines 56-66 for metal or inorganic material deposited by evaporation or sputtering, line 68 for flash evaporation and col. 5, lines 20-30 for acrylate monomers; col. 6, lines 24-33+ for flash evaporation, etc., of monomers; col. 7, lines 5-15 for curing. In Shaw et al (461), see the abstract;

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figures 2 & 4; col. 1, lines 15-18; col. 2, lines 14-12; Summary; esp. col. 3, lines 26-40+, col. 4, lines 7-9 & 23-31; col. 6, lines 23+ (acrylate monomers); col. 10, lines 10-43; col. 11, lines 26-50 (rotatable drum, inorganic or metal material deposited); col. 12, lines 50-64; col. 13, lines 1-10 and 51-61 (metal or other inorganic material by evaporation of sputtering onto cross-linked monomer), etc; and claims 3-5, 8-9, 15, 17-19, 22-24 & 36.

"Yializis et al ('893) or Shaw et al ('461), both differ from the claims by not disclosing that their inorganic material deposited between layers of flash vapor deposited and cross-lined acrylate is a transparent oxygen barrier film or that the acrylate layer is a smoothing layer. The primary patent references deposit the acrylate monomer in the same manner as taught by the present application, hence while the layer is not called a "smoothing" layer, it must inherently have the same effect when deposited on analogous plastic substrates, that may be thermoplastics as claimed.

"While barrier layers are not explicitly discussed, coatings for packaging materials and interlevel multilayers, such as substrate/acrylate/inorganic material/acrylate with possible repeated sequences are suggestive of barriers coatings, especially in view of Komiya who teaches the known usefulness of inorganic compounds, such as Si oxide as transparent gas barrier material in packaging materials (page 2, lines 10-25), and further teaches that such gas barriers may be improved by a polymeric overcoat (page. 3, Summary). Komiya provides specific examples of plastic substrates (polyester, polypropylene, PET, etc., page 3, lines 36-41), and of oxides or nitrogen, etc., such as Si_xO_y , Al_2O_3 , Si_3N_4 , where those that are transparent are particularly preferred, and deposition processes include sputtering, CVD, plasma deposition, etc. Therefore, it would have been obvious to one of ordinary skill in the art, given Komiya's teachings of the usefulness of those inorganic materials and their deposition techniques in preparing packaging materials, to employ them in the process of Yializis et al ('893) or Shaw et al ('461), for their taught packaging substrates and generic inorganic interlevel layer, for their known gas

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barrier properties, and expected effectiveness, especially given overlapping deposition techniques for specific destrable species of the primary references generic teachings.

"Note while there is no explicit teaching in the primary reference of a thermoplastic substrate being a roll of sheet material, one of ordinary skill in the art would have recognized that the normal bulk substrate supply made for sheet material to a rotating drum coating apparatus is via a roll, as the most practical and efficient storage/supply means therefore, hence making use of a roll obvious." (see the Office Action at pages 10-12, numbered paragraph 16).

Reconsideration is requested. Yializis et al. '893 and Shaw et al. do not describe the method of rejected claims 10-19. Komiya EP involves a considerably different process than the process employed in Yializis et al. '893 and Shaw et al. '461, and proposes a solution that would be counterproductive if used in the Yializis et al. '893 or Shaw et al. '461 processes. Komiya EP would not be combined with Yializis et al. '893 or Shaw et al. '461 by a person having ordinary skill in the art as proposed in the Office Action.

Komiya EP coats a substrate with a thin-film inorganic or metal compound (without discussing or depositing a smoothing layer) and laminates a "heat buffer layer" atop the thin-film layer. The heat buffer layer is employed so that the subsequent extrusion of a thermoadhesive layer onto Komiya EP's film will not cause the substrate to expand and contract and thereby cause cracking in the thin-film layer. Komiya EP in effect insulates the substrate from thermal effects caused by extruding the thermoadhesive layer onto the film. The reverse is also true, in that Komiya EP's thermoadhesive layer would be insulated from the substrate.

Yializis et al. '893 and Shaw et al. '461 mount their substrate on a cooled drum (see e.g., Yializis et al. '893 at col. 4, lines 51-54). They do so in order to facilitate condensation of the flash-evaporated acrylate (see e.g., col. 4, lines 54-55). Interposing Komiya EP's heat buffer layer between the cooled substrate and flash-evaporated acrylate vapor would discourage or prevent such condensation from occurring and would be counterproductive in the Yializis et al. '893 or Shaw et al. '461 processes. Accordingly a person having ordinary skill in the art would not look to Komiya EP to modify Yializis et al. '893 or Shaw et al. '461

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and would not combine Yializis et al. '893 and Shaw et al. '461 with Komiya EP as proposed in the Office Action.

Applicants thus request withdrawal of the 35 U.S.C. §103(a) rejection of claims 10-19 being unpatentable over Yializis et al. '893 or Shaw et al. '461 in view of Komiya EP.

Rejection of claim 20 under 35 U.S.C. §103(a)

Claim 20 was rejected under 35 USC §103(a) as being unpatentable over Yializis et al. '893 or Shaw et al. '461 in view of Komiya EP, or over Affinito as applied to claims 10-19 above, and further in view of U.S. Patent No. 4,468,412 (Fujii et al.) or U.S. Patent No. 5,403,626 (Kim et al.), especially in view of U.S. Patent No. 5,108,780 (Pitt et al.). The grounds for the rejection are set out in detail at pages 12-14 of the Office Action (see numbered paragraph 18) and in the interest of brevity will not be repeated here.

Reconsideration is requested. As noted above, Affinito is not available as a reference, and Yializis et al. '893 and Shaw et al. '461 would not be combined with Komiya EP as proposed in the Office Action. Additional reliance on Fujii et al., Kim et al. or Pitt et al. would not make Affinito available as a reference and would not provide a proper basis for combining Yializis et al. '893 or Shaw et al. '461 with Komiya EP. Applicants thus request withdrawal of the 35 U.S.C. §103(a) rejection of claim 20 as being unpatentable over Yializis et al. '893 or Shaw et al. '461 in view of Komiya EP, or over Affinito as applied to claims 10-19 above, and further in view of Fujii et al. or Kim et al., especially in view of Pitt et al.

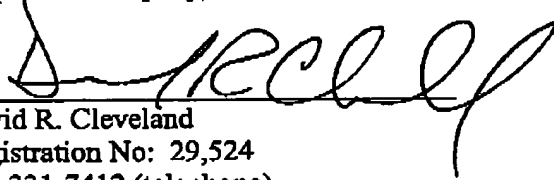
Conclusion

Applicants have made an earnest effort to address the issues raised in the Office Action. The related application information has been updated as requested. The claims have been amended as requested, or explanation or arguments have been provided to address the 35 U.S.C. §112 rejections. The double patenting rejection may be overcome via a terminal disclaimer. Williams '666 does not anticipate rejected claims 10 and 16-18. Affinito is not available as a reference. Yializis et al. '893 and Shaw et al. '461 would not be combined with Komiya EP (or further combined with Fujii et al. or Kim et al. or Pitt et al.) as proposed in the Office Action. Withdrawal of the rejections is requested.

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If there are any questions concerning the claims or this amendment, or any suggestions that might lead to allowance, the Examiner is encouraged to telephone the undersigned attorney at 612-331-7412.

Respectfully submitted on behalf of 3M Innovative Properties Company,



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